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09/706,217	11/03/2000	Stefano Soatto	7925US	7262

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EXAMINER

AHMED, SAMIR ANWAR

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/706,217

Applicant(s)

SOATTO, STEFANO

Examiner

Samir A. Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

1. Applicant's election of claims 1-32 in the reply filed on 4/09/04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

2. The disclosure is objected to under 37 CFR 1.71, as being ambiguous and incomprehensible. The word "frame" is used across the specification without any distinction between "glass frame" and "image frame" or any other frame. For example, on page 9, line 32 "reference frame", it is not clear whether frame refers to "glass frame" or "image frame of the face". This is repeated across the whole specification, for example pages 12, 14, and Fig. 7.

Applicant is required to submit an amendment which clarifies the disclosure by using the word "glass frame" when "frame" is used to mean "glass frame", and identify what is meant by frame when "frame" does not mean "glass frame".

Applicant should be careful not to introduce any new matter into the disclosure (i.e., matter which is not supported by the disclosure as originally filed).

Drawings

3. The drawings are objected to under 37 CFR 1.84(h)(5) because Figure 7 show(s) different use of "frame" in the same view. It is not clear whether "frame" used in all the steps of Fig. 7 are the same or different from "glass frame" used in step 228. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the

application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "the selected frame", in line 12, which implies that a frame selection has been made, however, there is no step of frame selection recited in the claim.

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Claim 1 recites, "glass frames" in line 6, "the selected frame", in line 12, and "the glass frame", in line 14. It not clear whether the selected frame in line 12 is a "glass frame" or "other frame". The Examiner is requesting the use of "glass frame" when the word "frame" is meant to be "glass frame" and identify the type of "frame" when "frame" meant otherwise, for all claims.

Claim 16 recites the limitation "the shape of the lens" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 20 recites the limitation "the shape" in line 3. There is insufficient antecedent basis for this limitation in the claim

Claim 29 recites, "from frame to frame" in line 3, and "reference frame", in line 4. It not clear whether "frame" in lines 3 and 4 means a "glass frame" or other type of "frame".

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 4-9, 22, 24-25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gao et al. (U.S. Patent 6,231,188) and Fay (U.S. Patent 5,983,201).

As to claim 1 [as best understood by the Examiner], Gao discloses a method for selecting and modifying the shape of eyeglasses utilizing a system, said method comprising the steps of:

receiving at least one image of a person's face (col. 6, lines 49-51, Fig. 1, item 10) and storing the received image in an image database (col. 6, lines 58-60, Fig. 1, item 22);

displaying the stored image to a user (col.6, lines 60-62, Fig. 1, item 26);

receiving a style selection by the user (col. 7, lines 5-13);

receiving the position of the center of the pupils in the image (col.8, lines 14-18, Fig. 2);

determining the axis of symmetry of the person's face (col. 11, lines 30-34, Figs. 2, and 10, centerline FC) and an approximate contour of the face as an elliptical two-dimensional template [facial shape is detected (col. 13, line16), fitting the boundary of the face using a parabolic-fitting (elliptical) (col. 14, lines 79-83), as shown in Figs 2 and 10 the face is modeled as an elliptical two-dimensional template];

determining a proper size of the selected frame (col.8, lines 19-21, Fig. 3); and

generating a virtual image of the person wearing the selected frame by

superimposing the image of the glass-frame to the image of the face (col. 6, lines 30-32, col. 7, lines 57-62, col. 9, lines 7-14, col. 10, lines 45-54 Fig. 4).

Gao discloses that a keyboard or a barcode scanner is used as input devices to the system. Keyboard is used to enter commands to the system to control eyewear selection function. Barcode scanner is used to scan SKU numbers from actual eyeglass

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frames to retrieve corresponding frame image from frame database (col. 7, lines 5-13).

Gao does not explicitly disclose,

displaying to the user a plurality of styles of glass-frames available through the system.

Fay discloses a system and method using a personal computer (PC) to examine how the customer would appear wearing different eyeglass frames fitted electronically to the customer (col. 2, lines 50-56). The customer interface display images of the eyeglass frames (col. 6, lines 20-12). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teachings of Fay to modify Gao's method by displaying to the user the different styles of glass frames available through the system in order to allow the customer to view the different glass frames available to select a frame based on his/her preference and lifestyle.

As to claim 4, Gao further discloses, the step of determining the position of features on the person's face [As shown in Figs 2 and 10, the position of the nose, the mouth, the chin (features) are determined on the face].

As to claim 5, Gao further discloses, the step of receiving a frontal image of the person's face (col. 11, lines 20-22) and storing the frontal image in a database (col. 6, lines 58-60, Fig. 1, item 22).

As to claim 6, Fay further discloses, wherein the system includes a server connected to at least one user device (Fig. 1, RES 20 is a server, connected to PC 14), said method further comprising the step of accessing the server via the user device [Fig. 1, PC 14 (user device) accesses RES 20 (server)].

As to claim 7, Fay further discloses, wherein the server is connected to the user device via a network (col. 6, lines 62-64).

As to claim 8, Fay further discloses, wherein the network is one of the Internet, an intranet, and a wide area network (col. 6, lines 62-64).

As to claim 9, Fay further discloses, wherein said step of receiving at least one image comprises the step of receiving two or more images of the person's face simultaneously obtained from two or more cameras oriented in a particular configuration (col. 8, lines 7-12).

As to claim 22, Gao further discloses, the step of modifying the selected style and shape of the frame while satisfying constraints due to manufacturing process and inventory [the rime size and bridge size for frame styles are provided by the frame manufactures and the frames are entered in the database by photographing the frame styles, the frames resized (modified) are obtained from the database (col. 21, lines 11-30) (i.e. the frames selected from the database satisfy the manufacturer constraints), also the frames in the optician's display board are photographed in the database (col. 21, lines 43-55) (i.e. the frames selected from the database satisfy the inventory constraints) .

As to claim 24, both Gao (col. 21, line67-col. 22, line 3) and Fay (col. 2, lines 59-60) further disclose, the step of receiving prescription data for the lenses.

As to claim 25, Fay further discloses, the step of transmitting shape and style data to a manufacturer who ships the selected eyeglasses directly to the customer (col. 2, lines 57-59).

As to claim 27, Gao further discloses, comprising the step of generating a two and a half dimensional model [a video camera and frame grabber generates video image frames (col. 11, lines 26-27), moving two dimensional images of the face are two and half dimensional face model].

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gao et al. (U.S. Patent 6,231,188) and Fay (U.S. Patent 5,983,201) as applied to claim 1 above and further in view of Andrew Blake et al., "Active contours", 1998.

As to claims 2-3, Both Gao (Fig. 2) and Fay (col. 7, lines 50-52), the step of determining the position of eye on the displayed image. Neither Gao nor Fay discloses, the step of utilizing a two dimensional template to determine a position of eyes on the displayed image and the step of refining the position of the center of the pupils to subpixel precision utilizing template matching.

Blake discloses that correlation matching is the oldest idea in visual matching and tracking that is widely used in practical tracking systems (page 105, last two lines). Correlation matching is often used in two dimensions with a template matched to an offset image as shown in Fig. 5.10 for mating eyes in face (page 109, the last paragraph, Fig. 5.10). An effective sampling scheme involves interpolation is used to sample a particular point in an image based on 4 neighboring pixels to subpixel precession (page 99, last paragraph, and fig. 5.3) in order to prevent undesirable effects such as jaggies in static images and twinkling effects in moving ones. It would have been obvious to one having ordinary skill in the art at the time the invention was made

to use the teachings of Blake to modify the combined method of Gao and Fay by using a two dimension template to determine the position of eyes on the displayed image and to refine the position of the center of the pupils to subpixel precession in order to practically tracking the eye position on the image and prevent undesirable effects such as jaggies in static images and twinkling effects in moving ones.

9. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gao et al. (U.S. Patent 6,231,188) and Fay (U.S. Patent 5,983,201) as applied to claim 9 above and further in view of Rafic A. Bachnak et al., "A Stereo System For 3-D Measurement In Robot Workspaces", PP 293298, IEEE 1989.

As to claim 10, Fay further discloses generating a 3 D image of the customers face using a three dimensional camera, or using two cameras with a known distance apart by taking simultaneous digital photographs (col. 8, lines 5-11). Neither Gao nor Fay discloses, the steps of:

estimating the epipolar geometry of the configuration of the cameras;

Rafic discloses a method and apparatus to generate 3 D image of a scene from stereo images generated from two cameras (Fig. 1). The performance of a stereo system greatly depends on a successful matching process. The determination of the point pairs in the two images that correspond to the same object point is known as correspondence problem and the displacement between correspondent pairs is known as the disparity of the point pair. The procedure used here makes use of the epipolar property of the stereo system. The algorithm is designed to increase the accuracy of the results (page 296, paragraph IV). It would have been obvious to one having ordinary

skill in the art at the time the invention was made to use the teachings of Rafic to modify the combined method of Gao and Fay to generate a 3 D image of the object (customers Face) by determining the epipolar property of the stereo system (cameras) in order to increase the accuracy of the results using a calibration procedure that is simple and convenient.

10. Claims 16-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gao et al. (U.S. Patent 6,231,188) and Fay (U.S. Patent 5,983,201) as applied to claim 1 above and further in view of Fujie et al (U.S. Patent 5,576,778).

As to claim 16, neither Gao nor Fay discloses further comprising the steps of:
associating a position of a set of control points to a set of perceptual
qualities stored in a database; and
modifying the shape of the lens based upon perceptual qualities.

Fujie discloses a design system for designing shapes of eyeglass lens and the front rims of eyeglass frames based on the information of facial features (perceptual qualities) (col. 1, lines 45-50). As shown in Fig. 16, the lens and the front rims of eyeglass frame are represented by control points of a Bezier curve, i.e., anchor points and auxiliary points are determined for drawing shapes of lenses and the rim of an eyeglass frame. The positions of anchor points (shape of the frame) are modified based on the profile of the face and the sex of the person (perceptual properties) to whom the design is being carried out (col. 6, lines 24-30). The execution of the processing for designing the shapes of the lens and the front rims of eyeglass frames is carried by a

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CPU that stores data in a memory (database) (col. 9, lines 22-29). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teachings of Fujie to modify the combined method of Gao and Fay by associating a position of a set of control points on the frame to a set of face profiles and sex of the person (perceptual qualities) stored in a database; and modifying the shape of the lens based upon the perceptual qualities in order to automatically generate the shapes of the lenses and the frames of the eyeglasses based on features of individuals and their design preferences.

As to claim 17, Fujie further discloses, wherein said step of modifying the shape of the lens comprises the step of modifying the shape of the lens based upon perceptual qualities chosen by the user (col. 9, lines 26-29).

As to claim 19, neither Gao nor Fay discloses, the step of controlling a lens-grinding machine in accordance with data received by the system.

Fujie discloses a design system for designing shapes of eyeglass lens and the front rims of eyeglass frames based on the information of facial features and a desired image possessed by the purchaser of the eyeglasses (col. 9, lines 59-67). The design system is connected to a machine tool for grinding eyeglass lenses and for shaping rims of the eyeglass frames (col. 1, lines 52-55, col. 9, lines 30-32). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teachings of Fujie to modify the combined method of Gao and Fay by controlling a lens grinding machine in accordance with data received by the system in order to manufacture eyeglass lenses and the front rims of eyeglass frames having shapes

designed for individual persons. This enhances the flexibility in the manufacture of eyeglasses.

11. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gao et al. (U.S. Patent 6,231,188) and Fay (U.S. Patent 5,983,201) as applied to claim 27 above and further in view of M.C. Burl et al., "Face Localization via Shape statistics", In. Proc. Of IEEE Conf. on Comp. Vision and Patt. Recog., 1995.

As to claim 28, neither Gao nor Fay discloses, the step of selecting a feature template for relevant facial features.

Burl discloses a face localization system in which local detectors are coupled with a statistical model of the spatial arrangement of facial features to yield a robust performance (Abstract). Identifying candidate locations for various facial features and comparing to a template set of responses (page 1, paragraph 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teachings of Burl to modify the combined method of Gao and Fay by selecting a feature template for relevant facial features in order to yield a robust performance of face detection.

As to claim 29, Burl further discloses, further comprising the steps of:

tracking the position of the feature templates from frame to frame (page 4, LC, paragraph 6, lines 38-55); and

selecting a reference frame (page 4, RC, paragraph 6, lines 1-14).

As to claim 30, Burl further discloses, wherein said step of selecting a reference frame comprises the steps of:

selecting a reference frame from one of a 2-D Euclidean, 2-D Affine, 2-D Projective, and 3-D Euclidean; and estimating a transformation (page 1, Abstract, page 2, paragraph 4).

12. Claims 11-12, 13-15, 18, 20-21, 23, 26, 31, 31 would be allowable if rewritten to overcome the objections and the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir A. Ahmed whose telephone number is 703-305-9870. The examiner can normally be reached on Mon-Fri 8:30am-6:00pm.

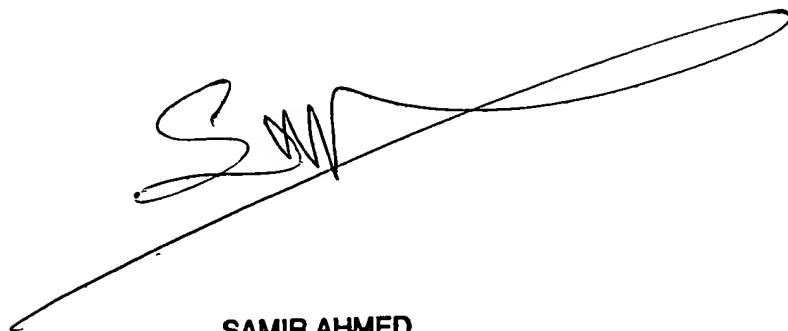
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to be 'SAMIR AHMED', written over a long, sweeping horizontal line that extends from the left margin towards the right.

**SAMIR AHMED
PRIMARY EXAMINER**